WHAT IS CLAIMED IS:

1. A method for digitally generating sound from phase and amplitude information of a narrow bandwidth signal, comprising the steps of:

(1) receiving said amplitude information and said phase information of said narrow bandwidth signal;

(2) determining phase-derivative information from said phase information;

(3) applying frequency gain to said phase-derivative information;

(4) summing results of step (3) with an audio wave carrier having an audio band frequency, and outputting control information that includes said results of step (3) imparted to said audio wave carrier;

(5) controlling an oscillator with said control information, wherein said oscillator outputs frequency modulation information that varies with respect to said phase-derivative information; and

(6) converting, at an output sample rate that is higher than said audio band frequency, said amplitude information and said frequency modulation information to an analog amplitude/frequency modulated speaker control signal.

2. The method according to claim 1, wherein said amplitude information and said phase information have an input sample rate that is lower than said audio band frequency, wherein step (3) comprises up-sampling said phase-derivative information to said output sample rate and applying said frequency gain to said up-sampled phase-derivative information, the method further comprising:

(7) up-sampling said amplitude information to said output sample rate prior to step (6).

3. The method according to claim 2, wherein step (7) further comprises filtering components of said input sample rate from said up-sampled amplitude information.

4. The method according to claim 3, wherein said filtering comprises performing an interpolation operation on said up-sampled amplitude information.
5. The method according to claim 3, wherein said filtering comprises a two-step sinc low pass filter interpolation operation.
6. The method according to claim 3, wherein step (3) comprises delaying said phase-derivative information to maintain coherence with said filtering.
7. The method according to claim 2, further comprising scaling said amplitude information to system gain.
8. The method according to claim 2, further comprising scaling said phase-derivative information to system gain.
9. The method according to claim 2, wherein said input sample rate is approximately 200 Hz, said output sample rate is approximately 48.8kHz, and said audio band frequency is approximately centered around 680 Hz.
10. The method according to claim 1, wherein said amplitude information and said phase information have an input sample rate that is substantially equal to said output sample rate.
11. The method according to claim 10, further comprising scaling said amplitude information to system gain.
12. The method according to claim 10, further comprising scaling said phase-derivative information to system gain.
13. An apparatus for digitally generating sound from phase and amplitude information of a narrow bandwidth signal, comprising:

an analog information path;

a frequency information path, including;

a phase differentiator module,

a frequency gain module coupled to an output of said phase differentiator module,

an audio wave carrier generator,

a summing junction coupled to outputs of said frequency gain module and said audio wave carrier generator,

a digitally controlled oscillator coupled to an output of said summing junction; and

an output section coupled to outputs of said analog information path and said frequency information path, said output section including an amplitude modulator coupled to said outputs of said analog information path and said frequency information path, said output section including an analog audio output terminal.

14. The apparatus according to claim 13, wherein said analog information path and said frequency information path include an up-sampler.

15. The apparatus according to claim 14, further comprising an interpolation filter coupled between said analog information path up-sampler and said output section, wherein said frequency information path further includes a delay.

16. An apparatus for digitally generating sound from phase and amplitude information of a narrow bandwidth signal, comprising:

means for receiving said amplitude information and said phase information of said narrow bandwidth signal;

means for determining phase-derivative information from said phase information;

means for applying frequency gain to said phase-derivative information and for outputting broader-bandwidth phase-derivative information;

means for summing said broader-bandwidth phase-derivative information with an audio wave carrier having an audio band frequency, said means for summing including means for outputting control information that includes said broader-bandwidth phase-derivative information imparted to said audio wave carrier;

means for digitally controlling an oscillator with said control information, wherein said oscillator outputs frequency modulation information that varies with respect to said broader-bandwidth phase-derivative information; and

means for converting, at an output sample rate that is higher than said audio band frequency, said amplitude information and said frequency modulation information to an analog amplitude/frequency modulated speaker control signal.

17. The apparatus according to claim 16, wherein said amplitude information and said phase information have an input sample rate that is lower than said audio band frequency, said apparatus further comprising:

means for up-sampling said amplitude information to said output sample rate; and

means for up-sampling said phase-derivative information to said output sample rate;

wherein said means for applying frequency gain comprises means for applying said frequency gain to said up-sampled phase-derivative information.

18. The method according to claim 17, wherein said input sample rate is approximately 200 Hz, said output sample rate is approximately 48.8kHz, and said audio band frequency is approximately centered around 680 Hz.

19. The method according to claim 16, wherein said amplitude information and said phase information have an input sample rate that is substantially equal to said output sample rate.

20. A computer program product comprising a computer useable medium having computer program logic stored therein, said computer program logic enabling a computer system to digitally convert phase and amplitude information of a narrow bandwidth signal to wider-bandwidth audio frequency information, wherein said computer program logic comprises:

a first function that enables the computer to receive said amplitude information and said phase information of said narrow bandwidth signal;

a second function that enables the computer to determine phase-derivative information from said phase information;

a third function that enables the computer to apply frequency gain to said phase-derivative information and to output broader-bandwidth phase-derivative information;

a fourth function that enables the computer to sum said broader-bandwidth phase-derivative information with an audio wave carrier having an audio band frequency, and that enables the computer to output control information that includes said broader-bandwidth phase-derivative information imparted to said audio wave carrier;

a fifth function that enables the computer to control an oscillator with said control information, wherein said oscillator outputs frequency modulation information that varies with respect to said broader-bandwidth phase-derivative information; and

a sixth function that enables the computer to convert, at an output sample rate that is higher than said audio band frequency, said amplitude information and said frequency modulation information to an analog amplitude/frequency modulated speaker control signal.